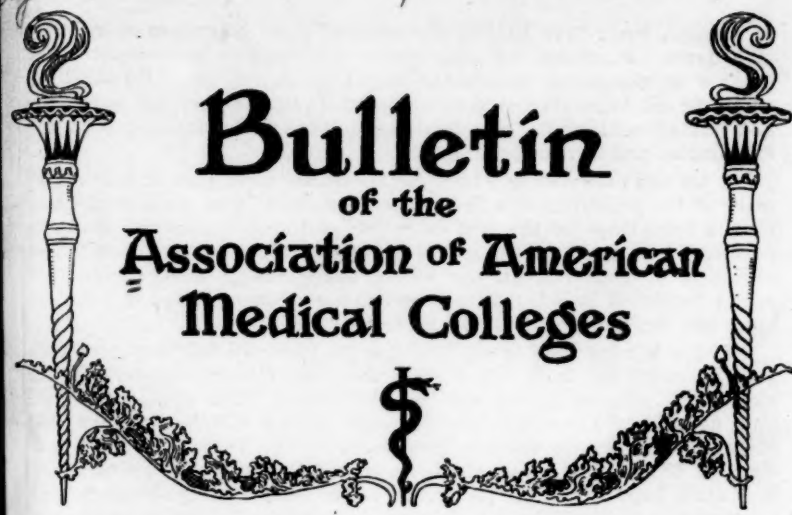


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THE PREMEDICAL COURSE

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During the past winter the premedical course at the University of Michigan has been under close scrutiny by a joint committee of the Faculty of Letters and the Faculty of Medicine. Though the committee has not yet formulated its report and I do not, therefore, wish to mortgage its opinion, a large amount of agreement has appeared and would seem to warrant certain deductions.

It was, of course, assumed that the purpose of the premedical course was to prepare students for the study of medicine and to enlarge their perspective in the field of general knowledge. If the course is really to fulfill its purpose, it must prepare students to become, if they have the capacity, the medical counsellors of the community. It would seem evident that if they are to achieve this distinction they must be educated people in the broadest sense of the word, since no problem in medicine can be judged to the best advantage except by the use of a wide perspective.

At the present time, the most striking characteristic of the minimum prescribed premedical course is the large proportion of elementary science. If one includes in this category the requirement in rhetoric

or English, more than half of the required sixty hours are specifically laid down. It seems not impossible that this large proportion of science as compared with what might be called the "Humanities" would be apt to result in the selection of students interested in science and having capacity in this field rather than those interested in the humanities and in mankind.

I am not prepared to admit at the present time that in the equipment of the practitioner a knowledge of science is of more real value than a knowledge of the way in which mankind has behaved in the past and how he is on the whole behaving at the present time. The problems of medicine, on the whole, are quite as likely to require sound judgment based upon a knowledge of history, sociology, philosophy and psychology as on the facts of science.

If one is concerned to see how this possible overbalance in science may be remedied, it is fairly clear that the present requirement in elementary science cannot well be diminished. The amount of time now devoted to chemistry, physics and biology is not excessive and there is much sound opinion in support of the view that additional work in the field of physical chemistry and bio-physics would be of first class importance. It is further fairly clear that the requirement in rhetoric or English—whichever term is used—cannot wisely be reduced, and it is again not improbable that it should be, if anything, increased.

Many or most medical schools and many state boards of registration require at least one year of college work in modern language which in practice means French or German. Some difference of opinion apparently exists as to the absolute necessity of this requirement of a modern language, looked at purely from the vocational aspect of its necessity to the physician of today. No question is raised as to the cultural value of a modern language but it is not clear that this requirement as it at present exists does add anything essential to the equipment of the physician. The extent to which literature in foreign languages is now readily available in English translation has altered the situation importantly in recent years.

We have, therefore, come tentatively to the conclusion that as an essential requirement in the premedical curriculum, the modern language is superfluous and might well be omitted except insofar as it is taken purely for its cultural value. In its present form it does not commonly result in the medical student being able to read freely the language which he presents for admission, and in practice the modern medical student does not use what knowledge he has in this field and the time spent upon it may, therefore, be adjudged to have been largely wasted.

But even if this common requirement should be omitted, the minimum course is still heavily balanced upon the side of science and if, as appears certain, the amount of science cannot be properly diminished, the only remaining alternative is the increase of the requirement upon the side of the Humanities. This, of course, means adding

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time to the medical course which, in some quarters at least, is now regarded as excessively long.

In the course of its investigations, the committee, above referred to, had occasion to call to its assistance a considerable group of physicians who had been engaged in the practice of medicine for periods varying from five to twenty years. It was interesting to note that in this group none believed that the six year medical course was too long, and all assented to the view that an increase in the premedical requirement was desirable. This evidence, though of small amount, tends to show that the doctrine that the present course brings the physician to the stage of practice too late is not supported by the views of the people concerned. The increased length of the period of study has probably not kept pace with the amount of knowledge and breadth of judgment which the community is becoming accustomed to expect from those who hold themselves out as medical counsellors. Looked at from the point of view of preparation for a job, the present six or seven years requirement may be adjudged long, but looked at from the point of view of what the public does in fact expect of the licensed practitioner, it is difficult, I think, to find support for the view that maturity of judgment can be developed with certainty under the present minimum requirement. There is growing support for the view that our recent medical graduates have spent too large a proportion of their time in the study of science in its possible application to medicine and too little in informing themselves in regard to the forces which govern human behavior.

Since an increase in the premedical requirement seems to us unavoidable, we are inclined to make that increase largely or wholly in the fields outside of science. It is suggested that some knowledge of anthropology and ethnology, a much more rounded knowledge of abnormal psychology, a broader understanding of sociology and a more thorough grasp of history would have the effect of broadening the view and consequently enriching the judgment of the medical student. Should the requirement be increased in this way, it might possibly serve to correct the suggested modern tendency of the course to put a premium on people with a scientific bent, and, perhaps, exclude from the medical schools those with broader human interests. It is my own view that a well planned course covering approximately three years of work in the Faculty of Letters with some increase in the pressure during the last two years would probably result in a product quite as well equipped as that which now comes to the medical schools with the bachelor of arts degree in a course not particularly selected, with a view to developing the qualities most necessary in the future physician. It is notorious that many candidates who present themselves with the degree of "Bachelor of Arts" have obtained this degree by very wide browsing in unrelated fields and with relatively little useable knowledge that will be of later service. The more I consider this question the more inevitable appears the increase of the requirement without further increasing the relative proportion of science.

PREMEDICAL EDUCATION

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Nothing is ever final in education. Each reform, however great an improvement it may bring to pass, is soon seen to be partial and inadequate, if not actually obstructive of the purposes which it was intended to accomplish. The reason is that social conditions do not stay put. The schools are always shooting at a moving target. Unless their aim is constantly changed the shots presently land where the target was but is no longer. The necessity for constant vigilance and progressive alteration of the educational procedure is undoubtedly more imperative in the training for the scientific professions than elsewhere in the educational field, because the present rate of increase in scientific knowledge is even more rapid than the rate of change in social conditions. And as the body of scientific knowledge grows, more and more of it has to be presented to the neophytes in the scientific professions.

Nowhere is the double problem of constantly readjusting professional training to meet new social demands and of constantly altering it to include new scientific material more acute than in the domain of medical education. Medical education, therefore, cannot be static. As soon as a reform is adopted it must immediately be subjected to criticism and must itself be reformed.

These preliminary observations are certainly not needed by way of exhortation to medical educators. In no other part of the educational world is there such a ferment as in medical education. No other course of professional training has in recent years been so radically reformed. No other has been subjected to such constant and thorough experimentation. And there is now going forward a comprehensive study that is designed to bring about still more far-reaching changes. There is enough "divine unrest" in medical education to suit the most restless progressive.

However, in all the discussions and in all the experiments, less attention has been paid to premedical training than to the work of the medical school. Consideration of the premedical curriculum, promulgated several years ago and now generally provided by colleges of arts and sciences, will of course be included in the study of medical education to which reference has been made. But pending the findings of that inquiry there is evidently a disposition to let well enough alone. This is perhaps natural. Nevertheless the university officer who is a layman in medicine sees the opportunity to enter the discussion at this point, for the administration of the premedical curriculum at least, if not the consumption of its product, is his concern rather than the concern of the medical schools.

OBJECTIVES

What is the premedical curriculum for? Apparently on this point there is some confusion of opinion. Without exact knowledge of the deliberations that led to the adoption of the premedical curriculum by the Council on Medical Education, I have always assumed that the principal end sought by the prescription of two years work as the common requirement for admission to the medical school was the broader and sounder general education of the physician. If that was the principal purpose it was at the start to some extent defeated by the transfer to the premedical curriculum of the basic sciences previously taught in the medical school and the prescription of definite amounts of time to be devoted to each. By this transfer the premedical curriculum became in effect medical education extended downward, and the opportunities of the colleges to provide as effective general education as possible for prospective physicians were seriously curtailed. Evidently teachers in medical schools are not yet wholly clear in their minds as to which of these two tasks, general education or specific training, the premedical curriculum should chiefly accomplish. They are apparently dissatisfied with the product of the colleges on both counts. Freshmen in medical schools do not know as much of the basic sciences as their instructors desire. There is also widespread complaint over their defective equipment in languages and in the social sciences, in short over their intellectual immaturity. The only suggested remedy that I have heard is to increase the allotments of time for certain of the sciences and possibly to lengthen the premedical curriculum to three years.

Certainly there will be serious objection to lengthening the period of training for medicine any further. Already our young men are one or two years behind their European contemporaries in starting their professional careers. It is doubtful whether either from the individual or the social point of view the addition of another year is at all feasible. In fact I believe we must for the present accept the total number of years now allotted to the various phases of medical education as a fixed quantity and plan to make whatever changes may prove desirable inside of this framework. If this view is correct and if the present product of the premedical curriculum is unsatisfactory on the score both of general education and specific scientific knowledge, two related questions present themselves for the joint attention of those charged with college education and those primarily responsible for medical training: (1) Which is more important for the medical student, thorough grounding in the basic sciences or wider general education? and, (2) Is it possible to improve the accomplishments in the natural sciences and at the same time to provide a broader and better education in other directions?

MOTIVATION

Dr. Abraham Flexner in his stimulating recent book "A Modern College and a Modern School" commends the premedical curriculum

on two grounds. It furnishes the preliminary scientific training which is needed as a basis for medical study. It likewise makes the student's college work purposeful and effective by organizing it around a coherent group of subjects with a definite vocational objective. Incidentally, it has toned up the college. I agree with Dr. Flexner that both the colleges and the medical schools have benefited by the experiment of the premedical curriculum. They have both benefited in the directions that he suggests—and of course their benefits are synonymous with the benefits which the individual students derive. I am much less confident than he appears to be, however, that the problem is practically solved. I am more inclined to regard the existing premedical curriculum as the first crude stage of a long experiment. The objectives of the experiment are the ones that he identifies, namely, to furnish training in science to medical students, to extend their general education, to motivate them for their future work, and to improve the organization of college education. I have already implied that the first two of these objectives are, by the testimony of medical teachers, very imperfectly attained.

How is it with motivation? On this point the evidence is certainly not of the scientific order, and it is somewhat conflicting. My observations made in many institutions during the last decade and reinforced by the intimate study of one institution, lead me to the following conclusions. In a very few places the premedical students are more interested and more earnest than the majority of the student body. In these places they are looked upon as the cream of the student body in the lower two years. Behind this situation in each place is at least one faculty member of superior organizing and teaching ability who has devoted himself primarily to the premedical group. But in the majority of institutions the situation appears to be quite different. Premedical students do not stand better than their fellows in the same subjects, they do not, as a rule, pursue the study of the basic sciences with the same interest that they later bring to the more definitely vocational work of the medical school. They are irked by the mechanical prescription of the premedical curriculum. Many of them wish to elect other liberal subjects and are unable to do so. They tend to regard the premedical course as a disagreeable preliminary penalty which they must pay for the privilege of studying medicine, and they cannot see its relation to their future profession. Where this is the attitude, the premedical curriculum as a motivating device fails miserably.

What I have just recorded summarizes only the result of personal observation supplemented by the testimony of various college officers. Obviously there should be brought to bear on so important a question evidence more reliable than the casual impressions of any individual. The workings of the premedical curriculum and the scholastic records and attitudes of the students enrolled in it throughout the United States should be objectively studied. The investigation would not be particularly difficult, or particularly expensive. Perhaps something of the sort will be attempted by the Commission on Medical Education.

If the Commission finds this impossible, means can doubtless be found within the next year or two to prosecute such a study under other auspices.

NEW MOVEMENTS IN COLLEGE EDUCATION AFFECTING THE PREMEDICAL CURRICULUM

Meanwhile those whose primary concern is medical education should not forget that important movements are going forward in the field of college education which are likely to change the whole setting of the premedical course. Ten years ago no one could have foreseen that the junior college idea would sweep the country. The separate junior colleges now number between two and three hundred. Four year colleges everywhere are experimenting with the administrative separation of the junior college division and the organization of the work of the first two years as a coherent and complete unit. No law-giver has yet arisen to present an acceptable formula for the junior college. But the new institution is already recognizing two diverse purposes. One is the completion of general education; the other is vocational preparation, in which is included pre-professional training. However, the emphasis thus far is increasingly on the first of these functions.

Many progressive college officers see in the concentration of general education within the junior college period, the salvation of the college. The plan to offer one remedy at least for the evils that have grown out of the aimless and wasteful conduct of higher liberal education. Where the plan is followed or projected, the senior college is devoted to specialization in the spirit of the graduate or professional school. The junior college course is designed to lay the basis for this specialization but not at the expense of satisfactory general education.

More students present themselves for college every year—and enter—but selective devices are becoming every year more rigorous and more accurate. Without undue optimism one may predict that the day of the loafer and the fool is almost over. In self-defence—as well as in defense of society—colleges will shortly restrict their hospitality to those who can and will profit by their offerings.

It does not take much imagination to see in the junior college combined with the growth of these precise mechanisms of selection, the coming of a new dispensation for American higher education. Will the present rigidly prescribed and dominantly vocational premedical prescription fit gracefully into this new college? Is it even as likely to furnish the medical schools with the type of students they desire as is a plan of study more closely resembling the new junior college curriculum which is emerging?

POSSIBLE EXPERIMENTS

The time seems to be ripe for some experimentation. Little can be done as long as the present premedical curriculum is practically prescribed for universities and colleges by the national bodies dealing

with medical education. I have elsewhere suggested the lifting of these restrictions. That is a necessary first step. Experiments might then take several directions.

If it be true, as the best informed observers declare, that the modern medical student and the young physician commonly lack sufficient general education, they are seriously handicapped. The possibilities of repairing these deficiencies after entrance into the medical school are slight, since the technical demands of the profession are so exacting. And indeed it is difficult to see how the general training of medical students can be other than defective. In college they have had extended contact only with the natural sciences, mathematics and the modern languages, including the vernacular. The whole field of the social sciences must be largely unknown to them, unless they have had a superficial introduction to it in the high school. To understand modern life, to play one's part in it as a citizen and particularly as a professional expert now demands a comprehension of social phenomena, their causes and their control. It is for this reason that the social sciences are coming tardily to form the core of most of the modern schemes of liberal education. Is any plan for the education of physicians defensible that deliberately deprives them of the opportunity to become acquainted with these moving forces of modern civilization, except as they may make the acquaintance on their own initiative and in their leisure time? I should therefore favor an experiment which would set up for prospective physicians a curriculum approaching in content the better junior college curricula now being constructed. This would include a considerable amount of the social sciences, especially psychology, sociology, history and economics.

Necessarily the time allotted to scientific and linguistic preparation would be somewhat curtailed. And medical teachers, as has been stated, already complain that the typical freshman in the medical school is not well enough grounded in the basic sciences. I am persuaded that these deficiencies can be overcome, even if the time devoted to the sciences is reduced. An adequate scientific foundation could probably be provided in several ways. I venture to suggest one. Let the medical schools define in terms of achievement, not in semester hours, the minimum necessary preparation in physics, chemistry and biology. On the basis of such a definition courses in these subjects especially designed for premedical students could be organized. Courses of this sort need not be less rigorously scientific than those now given to meet the premedical prescriptions, they would only be less extensive, less discursive. Surely through the medium of such courses as are here suggested spread over a period of two years (or possibly longer if a portion of the high school course were included) our students might still be better trained in the basic sciences than are their fellows in most of the European countries before entering upon the special training that is the province of the medical school.

I regard the failure of the premedical curriculum to motivate prospective medical students as no less serious than the other defects

that have been noted. Can it be improved in this direction? It is an elementary psychological truth that subjects of study preparatory to any calling gain in vividness and interest to the student in proportion as they are clearly related to the actualities of that calling. Probably few young men decide to study medicine without being strongly attracted by what they imagine to be the characteristic activities of the doctor's professional life. These activities are based on intimate association with sick and suffering human beings. It would probably not be too much to say that the vast majority of those who choose a medical career do so because they desire this sort of association. The plan of medical education now current in the United States postpones all these contacts for nearly four years after the student enters the university and begins his professional preparation. For two years he is not even given an opportunity to see or hear about the simple phenomena of disease. Is it any wonder that the premedical course presents itself to him too often as a barren stretch of wilderness that he must perforce wander through before reaching the promised land?

Perhaps this condition could not be corrected by any simple formulae. The lines of possible experimentation, however, seem clear. Material now reserved for the medical school might be introduced in connection with the scientific courses of the premedical curriculum, particularly in biology and chemistry. Through the medium of other subjects in the premedical curriculum, the work and problems of the doctor could be presented. Indeed, a medical orientation would be possible and profitable in several subjects in the curriculum without impairing their general validity.

The foregoing suggestions are offered not as representing a program, but merely as suggestions. As far as I have a plea to make it is for experimentation, not for a particular experiment. I am convinced of the necessity of improving, of largely recasting the premedical curriculum just as soon as universities are free to go at the task. Even a tentative definition of the details of a productive experiment is something that the layman hardly has a right to attempt.

THE NEUROLOGICAL STUDY UNIT IN THE YALE UNIVERSITY SCHOOL OF MEDICINE

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The Yale School of Medicine numbers among the members of its staff several men whose chief interest is in the nervous system. The faculty is committed to a program of intensive cooperative study in the various branches of the science of medicine. The New Haven Hospital cares for a sufficient number of neurological patients to provide ample material, but not so many that their care becomes a serious burden to the clinical staff.

These three factors, interest, cooperation and material provide an ideal situation for the study of the nervous system. Therefore, a Neurological Study Unit has been organized. It consists primarily of a Neurological Committee composed of those members of the faculty whose chief interest lies in the anatomy, physiology, pathology and organic and functional diseases of the nervous system. As it now operates, it includes a neurological surgeon, two internists, a pathologist and an anatomist. Each week a survey is made of those patients in the hospital who present evidence of damage to the nervous system. From these the most interesting cases are selected and a preliminary neurological examination is made. On one selected day in the week the committee meets in conference at the bedside. All of the clinical aspects of the patient are discussed and the physical and neurological findings checked. Following this the group adjourns to the seminar room and there the case is discussed as completely as possible and an attempt is made to diagnose the case, to locate the lesion and to identify the functional mechanism in the nervous system that is damaged. Summaries of the neurological findings are kept as completely as possible and an attempt is made to forecast the damage that is done to the functional pathways of the brain and spinal cord. If any of the cases come to necropsy the portions of the nervous system there obtained are studied as completely as possible, not only with respect to the damage at the site of the lesion but also with respect to the neighborhood or distant injuries. It is hoped in this way to study the entire nervous system of selected cases in the anticipation that material advance can be made in our knowledge of the correlation of symptomatology with defects in the nervous system.

The organization described lends itself admirably to the accomplishment of several objectives. In the first place, it is a cooperative enterprise that cuts across departmental divisions. By its means, experts in the various phases of the nervous system pool their knowledge for a common aim. Each case is studied carefully by each of the specialists and their contributions integrated into a complete picture of the problem. This means that all the men interested, clinicians, pathologists and anatomists watch the case through its entire course and cooperate in the attempt to evaluate the problem and contribute to its solution. The method here exemplified cannot help but result in contributions of definite value to our knowledge of the form and function of the nervous system. Furthermore, when opportunity makes possible post-mortem examination, there is provided ample material for intensive research for staff and student alike.

The primary object of the organization is the furtherance of our knowledge of the nervous system, but it also subserves another very important function. A limited number of students in the medical school are admitted to the ward rounds for conference and certain of them are assigned to the preliminary neurological examination of patients. It has been found that a small number of students have availed themselves of this opportunity and have profited much by the clinical con-

ferences and by the attempts to explain the symptomatology on the basis of anatomical change. This means that it is possible to give the students a very much more complete and closely coordinated view of the nervous system than by the ordinary method.

There has been established, then, at the Yale University School of Medicine, a Neurological Study Unit whose object is cooperative study of the form and function of the nervous system and an efficient mechanism for training students in neurology.

THE PROGRAM OF THE UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE

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The University of Illinois is a public institution and belongs to the people of the State. In general, it must do what the people wish it to do. It must grow in accord with their desires and demands and the policy of the State University is, therefore, shaped accordingly. The College of Medicine is an integral part of the general university and its policies and program must, in general, conform to those of the main university.

Policies and programs of universities are, in the main, determined by analyzing and correlating the opinions and wishes and desires and ideals of a large and diverse body of people. Nearly every form of activity today is organized largely for its own interests and ideals, and it is no doubt true that often the special classes place their own interests above the interests of the people. Problems and difficulties shape themselves in such a way that the public welfare receives a consideration secondary to the interests of the special groups. This appears to be true all along the line. A public institution such as a state university must constantly be on its guard to see that, first, the people get a square deal. They must also see to it that the interests and demands of the special groups receive proper consideration in relation not only to their own needs but to the needs of the people so far as they pertain to university affairs. Any program of the University of Illinois College of Medicine must be worked out in accordance with these general principles.

More immediate consideration are the general purposes of any medical college, namely: first, the proper training of the student for the general practice of medicine (largely undergraduate work); second, the training of men for the specialties (largely graduate work); third, the presentation of courses for practicing physicians (post-graduate courses); fourth, advancing the theory and practice of medicine by study and research work, and fifth, as an adjunct to the above aid to the sick poor.

A medical program will depend also upon many special considera-

tions and of first importance are the facilities for conducting the work. In Illinois there are several organizations supported by public funds which cooperate for the health of the people of the state. These are, first, the State Department of Public Health; second, the Department of Public Welfare which deals primarily with the wards of the state, including insane, blind, deaf, etc., and third, the State University.

The Department of Public Welfare, recognizing the need of assistance which might come from the university, erected a group of hospitals in close association with the buildings of the College of Medicine in the medical center of Chicago adjacent to Cook County Hospital. This is a cooperative affair; the Department of Public Welfare being mainly concerned with administration and maintenance, whereas the university supplies the medical service necessary for the hospitals. There has thus been provided a group of buildings including a new general hospital of somewhat over two hundred beds; a large outpatient department on the first floor through which all patients to the hospital are admitted; a laboratory building to serve the hospital for routine and research work; a library building, closely adjacent, housing about 35,000 volumes. There is also a building for psychiatric patients not yet occupied and a children's building used at present by the Illinois Institute for Juvenile Research. Institutes for other specialties are contemplated ultimately.

The Dental and Pharmacy Colleges of the University are located near by and cooperate in furnishing their services in the conduct of the hospital work. Additional facilities for the college work are furnished by several affiliated hospitals and by Cook County Hospital across the street and other independent hospitals, notably Michael Reese and St. Luke's. The beds of certain municipal institutions, such as the City Contagious Hospital, are also available owing to a most helpful and happy cooperation between the Chicago Health Department and the different medical schools in Chicago.

The university has adopted the general plan of full time heads of departments in the fundamental subjects; whereas, in the clinical branches the system is a mixed one, the tendency being to employ more and more on a part time basis.

Many problems relating to the internal work of the college and especially the curriculum might be discussed but only a few will be considered briefly. The undergraduate work will, of course, receive first consideration, for it is fundamental. At present a revision of the curriculum is being made with a view to better correlate the work of the different years and different departments; to the end that more clinical work will be introduced early in the student's career; and some of the fundamental subjects will receive more consideration in the junior and senior years, thus intermingling the work all along the line. This, no doubt, will tend to give the student a more unified conception of disease processes and should to some extent save time. More and more will the importance of clerkship work in the hospitals be stressed and brought into relation with the laboratory and didactic work.

Second in importance only to the question of correlation of courses is the matter of course content. Constantly must the actual data presented be revised to include new facts discovered by research, and to discard old data that were wrong or impractical or obsolete; also to change perhaps a point of view or to stress a new general tendency in medicine. This problem of the shifting of emphasis from one field of medicine or from one department to another is a matter that requires constant adjustment. One sees striking examples of it repeatedly as one reads the history of medicine. How, for example, some years ago emphasis shifted from *materia medica* to diagnosis; and recently from morbid anatomy to biochemistry.

The graduate work at the College of Medicine is now and will continue to be an extension of the graduate system in the general university at Urbana. In practically all departments, both in pre-clinical and clinical subjects, students may register for advanced work leading to degrees of M.S. or Ph.D. These courses are designed to train students in special fields, usually for a considerable time, ranging from one to three years or more. Essentially, a bachelor's degree is a requisite for admission into the graduate school. Here we have to do with the problem of the specialist not in the narrow sense of taking a few months training in a specialty, but in the broader sense of a thorough training in the fundamentals of the specialty together with experience in the practical side of the work; also training in the productive type of scholarship. It may be pointed out that the university may train men for certain specialties but further than this it cannot go. It has no way at present to control specialism, or to determine who shall or shall not become specialists. If the medical profession and the state boards, for example, would get together and specify more clearly what constitutes a specialty and what the training should be, the universities could very soon arrange their courses accordingly. In this general problem dealing with advanced courses and graduate work, the policies of the university modified to meet the special problems in the medical school will no doubt be adhered to.

At present short practical courses for physicians of the State are being arranged for certain periods of the year. These embrace or will embrace work in practically all subjects both in fundamental and clinical branches. For both the graduate work and the physicians' courses the opportunities furnished by the general hospital will, of course, be invaluable. Also the library and research laboratory buildings, the various institutes associated with the university and the Department of Public Welfare, together with the Colleges of Dentistry and Pharmacy, should serve most effectively.

As a state university, we recognize that this program of medical teaching for the physicians of the state should be stressed. In time it is proposed to extend this beyond the confines of the medical institution to the cities and counties of the state in the form of clinics and lectures and other forms of extension work.

In this day, when the common sense idea of prevention dominates

every field of activity, whether it be medicine or some other science, it is natural that it should exercise an important influence upon the work of the medical school. The scope of preventive medicine is so broad that it concerns nearly every department not only of the medical school, but of the entire university. Dr. Wm. H. Welch in a recent lecture* has defined preventive medicine in such a concise and comprehensive way that I quote as follows: "Public Hygiene is not strictly speaking an independent, concrete science in the sense in which we apply this term to anatomy, physiology, or pathology, but is the application of various sciences, as chemistry, physics, zoology, physiology, bacteriology, pathology, engineering, statistics, and still others, to the end of preserving and improving health and preventing disease. This end, however, is so important, specialized, and definite that it gives coherence to the body of doctrines and their application derived from other sciences for its attainment. In this sense, and in this sense only, there is no impropriety in speaking of the science and art of hygiene or public health, and there is much convenience in this usage."

With this definition in mind, it is difficult to think of preventive medicine as a specialty. It is a most comprehensive field broader than curative medicine and almost as broad as general science. It is rather a point of view than a specialty or a department, and one's conception of it will no doubt be determined largely by his own field of activity. But surely, we will agree that the preventive aspects of medicine should never be divorced from practical medicine. No one could separate them if he tried for the simple reason that diagnosis of disease, it would seem, must always remain the most skilled work of the practitioner of medicine; and public health and preventive medicine must depend fundamentally on diagnosis. A health survey, or the ordinary work of a Health Department could hardly begin without the diagnostic services of the practitioner of medicine.

This field, therefore, is so broad that it is impossible to cover it by special courses. The principles may be stated and certain aspects of the problem may be presented in this way. No doubt the proper method of procedure is to include in the content of practically every course, the preventive aspect of the subject or disease in question. This method is not new for every great medical teacher always has done this going as far as the knowledge of the science of the time would permit him to go. As Sir George Newman, chief medical officer of the British Ministry of Health, has put it: "The cogent and penetrating question for every medical practitioner to answer is 'What can I do to prevent this disease?'" Some medical men seem concerned about the relation of the physician to the activities of the health officers; but there seems no reason to fear provided the practitioners adopt the preventive point of view which all great physicians have always taught. Diagnosis, of course, is the key to the whole public health problem. While many of the problems of public health must be turned over to others for solution and especially to the engineering profession, still, it would seem

*Public Health in Theory and Practice, Yale University Press, 1925.

that the person trained in medicine with special training in certain related lines, will no doubt in the long run be best able to control disease—at any rate will be best able to guide the work of eradication. It has always been so and in this respect history is not likely to reverse itself.

In order to assume these responsibilities, therefore, the programs of medical colleges must be arranged to meet these pressing needs for the prevention of disease. The people are becoming thoroughly alive to the progress that preventive medicine has made largely through the work of medical men, and no doubt they will press their demands more and more along these lines.

In general, then, we may say that the program at the University of Illinois will continue in harmony with the present modern tendencies in medicine which are essentially sound because based upon the principles of science and practice. First, we must meet our state obligations by training students to be good common sense doctors—doctors who can make accurate diagnoses and, if necessary, a reasonably accurate one independent of a laboratory or a roentgen machine. And second, we must encourage and further medical progress through new discoveries, inventions, improvements and preventive measures in every field that bears upon disease.

There is no thought of revolutionizing the teaching or the practice of medicine or of changing in spectacular fashion the existing order of medical science. Much of the old time medicine is still most valuable and useful. We need the literary style, the scientific spirit and the ethical ideals of Hippocrates. Perhaps, we need his oath more today than ever. We need at least some of the preparations of Galen, together with his experimental method and his self-confidence. We need the imagination of Fracastoro of Verona who could state so clearly the modern idea of infection long before a microscope was made. We will continue to admire the anatomy of Leonardo and Vesalius. We would not discard the pharmacology and therapeutics of Paracelsus in spite of his bombast. Nor could we do without the good sense and keen powers of observation of Sydenham; or the experimental method of Harvey; or the pathology of Virchow; or the bacteriology of Pasteur and Koch; or the bedside teaching of Osler.

A condensation of the ideals, the teachings and the spirit of all the masters is quite sufficient upon which to build a modern medical program.

MODERN EDUCATIONAL METHODS AND THEIR RELATION TO MEDICAL EDUCATION

E. STANLEY RYERSON

Secretary, Faculty of Medicine University of Toronto

A knowledge of the main features of the teaching methods which are being subjected to experiment in schools of the present day may be of assistance to those interested in the problem of teaching medical students. The method of allowing children of kindergarten age to educate themselves by placing before them facilities from which they acquire ideas and facts of various kinds was introduced first in Italy by Mme. Montessori. The teacher occupies a purely secondary place, answers questions and acts as an assistant and guide to the child instead of a dictator and instructor. Although not many schools have adopted this idea in its entirety, still many of them have realized the advantages of the underlying idea and modified their methods accordingly. The chief feature of the method consists in centering the attention on the child and keeping the teacher in the secondary position.

The same principle exists in the Dalton Method, which is being tried for older children. A certain assignment of work is given to a class to be accomplished in a limited time, a week or a month, and at the end of this period a test is made of the degree to which the material has been assimilated. The teacher is present as supervisor and guide, answering questions and explaining difficulties, but without "teaching" in the ordinary sense of the term. It was first tried in High School in Dalton, Massachusetts, by Miss Helen Parkhurst and has been since called the "Laboratory School" plan. The class rooms are regarded as laboratories where the pupils carry out the practical work of their studies by the help of apparatus, just as scientific apparatus is placed in the ordinary laboratory. The outstanding feature is the increased responsibility placed upon the pupils.

In order to stimulate the interest of pupils in their studies, Mr. H. Caldwell Cook has introduced a method known as "The Play Way." He endeavors to get the pupils to take an active part in learning by encouraging them to carry on debates, give little lectures and write topical verses. The chief concern is the development of an attitude toward their lessons similar to that toward their games. He tries to make them feel that their work is a game so as to make them show initiative and interest. The work is not treated frivolously, but with due seriousness. So long as the pupils get enjoyment out of their work, no difficulty is met in getting them to concentrate upon it.

The operation of the underlying principle of this method is seen in medical education in the change of attitude of many students when they begin seeing and diagnosing actual cases in the hospital, after leaving the practical studies in the laboratory and dissecting room. The introduction of clinical teaching in the earlier years of the course is based to a certain extent on this principle.

The general recognition of the purposive element is another of the modern tendencies in school method. The view that pupils should know why they learn this or that in school has been very widely accepted. The problems met with have to do with real life instead of some vague hypothetical situation. Out of this idea, there has developed what is called the "Project Method." The basis of this scheme consists in providing for the students the development of some problem from actual life and in enabling them to evolve the underlying principles. Instead of studying individual subjects, learning their principles and being left to apply and correlate them at some later stage in life, the pupils are brought in contact with some actual experience in the expectation that they will see the relations and applications and draw therefrom conclusions as to the principles involved. Instead of systematically covering physics, chemistry and biology in a science course in the high school, instruction is given in such projects as "Inventions—wind mill; water mill; their uses; the lift pump; levers; pulleys; simple machines in physics; or 'iron smelting of ores; cast iron and steel' in chemistry or 'pond life in the fall; turtle; frog; the pond as a life society or life group' in biology."

The "proponents" explain that everybody in the world but school-masters follow the Project Method as a matter of course, but that these content themselves with theorizing about and over-systematizing everything, so that no real progress can ever be made. The average teacher, however, feels that a certain minimum of system should be preserved in his teaching work and therefore refuses to accept this new method in its totality. A conflict exists between the two extremes. On the one hand, the endeavor is to make the student acquire a systematic and organized knowledge of each particular subject by leading him logically from the elements of each to a complete conception of them all; but leaving their integration, correlation and application to the chance experience of each individual student.

On the other hand, there are those who consider it more important to attain an intelligent organized grasp of the whole with a realization of the relations and applications of its component parts. For the latter, the Project Method holds out many advantages over the older more formal type. The solution probably lies between the two extremes. The tendency in the past has been unquestionably to pay too much attention to individual subjects and too little to the organized knowledge of the whole.

Such a state exists in medical education, in which individual subjects are taught to a large extent independently of one another and with no purposive effort to produce a well-balanced co-ordinated, organized, practical conception of the whole field of medical science. The introduction of the study of certain large subjects along the lines of the Project Method would assist in attaining this result. In the earlier years, such projects as inflammation, either from the destructive or reparative aspects, would bring about a clear idea of the relations of anatomy, histology, bacteriology, pathology, medicine and surgery;

while later, chronic disturbances of the digestive tract would form a topic that would bring into action a knowledge of most of the fundamental, laboratory and clinical subjects.

The big unit of study would be an excellent corrective of our present fragmentary cumulation of knowledge. It is not suggested that the present systematic teaching of individual subjects should be done away with, but that a certain proportion of it in each of the years should be replaced by the adoption of the study of a number of projects of the type proposed.

The tendency to correlate pupil and subject matter without emphasizing one at the expense of the other is seen in a movement occurring in French educational circles known as "integral instruction." "Our present education is," as a distinguished French educator (Ernest Lavisse) remarks, "a case of a fragment of an educator addressing itself to a fragment of a pupil." And he might have added, "about a fragment of a subject." To overcome this, the "integralists" are trying to establish a system in which all the elements will be so correlated as to form an organic whole. "What is wanted is not merely that the curriculum should be so organized as to present an organic unity of subject-matter, but that the staff of the school should act as an educational unity in its influence on the individual pupil."

Many medical schools of today fulfil the former part of the above statement to a greater or lesser degree, but only a very few have given the latter part much consideration. The organization and teaching of individual departments is often excellent, but the whole instructional staff in no way act as an "educational unity." President Lowell of Harvard referred to this idea at Boston in March, 1925, when he used the simile of comparing medical education to a building consisting of a number of columns, in which each column (or department) was as perfect as it could be made, but without much regard to the part it played in the construction of the building as a whole. There is a lack of team-play in the education of the student in medical faculties. Many staffs have as fine a group of individual departments as can be found anywhere, but it is well known that no team of individual stars can compete successfully with one in which combination team play has been fully developed. The efficiency of medical education might be raised to a far higher plane by greater attention to the unity of their purpose.

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Address all communications to the Editor.

The Bulletin

Fifteen years ago the Association published a quarterly bulletin which was devoted entirely to the dissemination of news of interest to medical colleges. Even with this limited scope it filled a much needed want. After two years of existence, lack of funds necessitated discontinuance of this publication. Four years ago it was voted again to publish a Bulletin, but no funds were provided. Now, it is possible to resume publication, and this number is the first of the new series.

At the Charleston meeting held in October, 1925, the annual membership dues were raised to \$100 per year—for the sole purpose, as stated by the chairman of the Executive Council in his report to the Association, of providing funds to resume publication of a bulletin. This increment to the finances is to be used to defray the expense of publication,—printing and mailing.

There has never existed a publication of any sort that was devoted wholly to furthering medical education or to serve as a medium for dis-

seminating views on medical pedagogy. The BULLETIN will serve these needs. Teachers in medical schools will find here a means to bring to their fellows new methods of teaching on which discussion is sought. It will also publish all news regarding medical schools, changes in faculty, new appointments, new facilities, buildings and equipment—any news in which medical school men are interested. The endeavor will be to publish all news of medical colleges so that it will no longer be necessary to scan many publications, each one of which has hitherto given a part of this news. It will be the only publication of its kind in the world,—a journal devoted to medical education and medical pedagogy. Furthermore, it will bridge the gap, the time interval, between annual meetings, thus helping to keep in closer touch with each other those who are interested in this field of activity.

The BULLETIN is the organ of all the medical colleges in membership in the Association, and it is planned to distribute a sufficient number of copies to each school so that every member of the faculty may receive one. The size of the BULLETIN is the same as the size of the annual volume of *Proceedings*, thus making it possible to have uniformity in bindings and keeping together the publications of the Association for ready reference. The *Proceedings* will be continued, and will contain the proceedings of the annual meetings. The BULLETIN will be supplementary to the *Proceedings*.

All members of medical faculties are invited to contribute copy for the BULLETIN. As a matter of fact, if such contributions are not received, the BULLETIN cannot exist. Deans and others are urged to send news items to the editor and any other copy they may wish to submit. Original papers will occupy the bulk of the space in the BULLETIN. Editorial matter should be signed. Abstracts of articles on medical education and medical pedagogy appearing in other publications will be offered. It

is astonishing how much material can be prepared for publication in the BULLETIN. Inspection trips have disclosed that many faculty members would like to publish something on teaching if there were a place to publish it. The BULLETIN provides that opportunity.

The BULLETIN will be published quarterly, in January, April, July and October. Four issues will comprise a volume. It will be mailed directly to any address, if desired, or to the college office in large numbers for further distribution from that place.

Call for Next Annual Meeting

The thirty-seventh annual meeting of the Association will convene in Cleveland, Ohio, October 25, and will continue for three days. A copy of the tentative program is printed elsewhere in this issue. The Hotel Statler has been selected for headquarters, and all the meetings will be held in the hotel. It is advisable to make room reservations early to insure securing desired accommodations, although the hotel authorities have given assurance that ample good accommodations will be available. Reservation cards will be mailed to each college by the Hotel Statler.

Bulletin Mailing List

In order to give the BULLETIN the widest possible distribution, it is requested that every college send to the secretary the names and addresses of persons who may be interested in medical education, of libraries and institutions that wish to keep the BULLETIN on file. There is no charge for such service as the BULLETIN is free. Its purpose is to disseminate information in this field. Contributions of copy are not limited to deans or executive officers of medical schools. Members of faculties, medical and otherwise, general educators—any one, in short, who wishes to contribute to the literature on medical education and medical pedagogy, is

invited to send in copy and names for the mailing list. However, it is not the object to create the largest mailing list in the world, but a list that will be representative of individuals who may be concerned with or interested in medical education.

Program for the October Meeting

The tentative program for the October meeting, which will be held in Cleveland, October 25-27, is as follows:

Relation of Collegiate to Medical Student Scholarship—John A. Wycoff, University and Bellevue Hospital Medical College.

Determining the Fitness of the Pre-medical Student—Franklin D. Barker, University of Nebraska.

Study of Disposition of Applicants For Admission to Schools of Medicine for 1926-1927—Burton D. Meyers, Indiana University.

Combined Baccalaureate Courses—Stuart Graves, University of Louisville.

Extent of Specialization in Medical Practice—H. G. Weiskotten, Syracuse University.

What Becomes of the Woman Graduate?—Martha Tracy, Woman's Medical College.

Cost of Medical Education—Fred. C. Zapffe.

Teaching of Medical Economics—Albert T. Lytle, University of Buffalo.

A Study Conference Course—J. W. Pryor, University of Kentucky.

The Irreducible Minimum Curriculum—W. F. R. Phillips, Medical College State of South Carolina.

Round Table Conference

System Used for Junior and Senior Clerkships in Medical Wards and Medical Dispensary—John W. Moore, University of Louisville.

The History of Medicine; the Backbone of Teaching in Clinical Medicine

—Charles P. Emerson, Indiana University.

Student Assistants in Medical Courses—A. P. Mathews, University of Cincinnati.

Senior Student Acting Interns—Russell H. Oppenheimer, Emory University.

An Experiment in Teaching Physiology—Alfred C. Redfield, Harvard Medical School.

An Experiment in Education—Hugh Cabot, University of Michigan.

Use of Pathological Museum in Teaching Medicine and Surgery—Howard T. Karsner, Western Reserve University.

A New Plan in Medical Education—M. C. Winternitz, Yale Medical School.

Executive Session.

While this program appears to be rather full, it must be recalled that the Round Table Conference portion consists of talks which will be short and snappy for the purpose of arousing immediate interest and free discussion. These talks are the bait for discussion. They give opportunity for a free and informal exchange of views and to ask questions. An entire half day will be devoted to this portion of the program.

There is still room on the program for a few papers. Titles must be sent to the secretary soon.

As has been the custom for a number of years, it is planned to visit the medical school of Western Reserve University on Tuesday morning.

Undergraduate Education in Health Examinations

While fulfilling their primary function of training men and women for the diagnosis and treatment of the sick, medical schools can without addition to the curriculum make a contribution to the prevention or post-

ponement of disease and death by dealing systematically with that element of medical service which is termed commonly the health examination. This is to all intents and purposes a search for variations in structure or function of the body and for disturbances in human relationships, conduct and emotions which, although not yet the subject of complaint by the patient, may if disregarded develop into disabilities affecting unfavorably the duration and satisfaction of life.

Such training in this field as is here suggested should include not only the method of making a complete medical examination of a presumably healthy person seeking a physician's opinion, but the advice found to be needed to assure a continuation of health or its reestablishment when some one of the common unhygienic habits are disclosed which require correction.

The appropriate starting point for the training of a medical student in health examinations is the conduct of such a procedure upon the student by a member of the department of practice of medicine, repeating this each year. Each such session requires almost one hour of the examiner instructor's time, taking advantage of the information in the history and examination to show the reason for each question and observation in terms of health protection.

The assembled material from these examinations should be presented in an hour session once a year in the course in preventive medicine, public health, or hygiene as a basis of clinical and statistical discussion, illustrating the range of defects in this selected age and intelligence group by typical cases with results of correction. On this occasion experience with other groups, drawn from civil service, army, industrial life, life insurance, and public clinic or health center practice should be related, showing the range in scope of the examination and hygienic advice according to the age, sex, economic, occu-

pational, intelligence groupings of those examined.

As collateral contributions to the main objective, which is to show the medical student how his knowledge of the medical sciences can aid him in recognizing signs of disturbance before a disease or disability has become a conscious cause of complaint to the patient, and how by the modification of the conduct of life his so-called health patients may better adapt themselves to their environment, each department must take cognizance of this new medical objective.

In physiology the demonstration of changes in exercise and food as they affect body weight, the effect of training of the reflexes in bowel evacuation, the effect of large and small amounts of water in the dietary, the effect on weight of insufficient sleep could be included with advantage in existing courses with a view to giving a sound basis for hygienic advice.

In anatomy the relation of errors of posture to physical habits and to occupational attitudes, the recognition of the several types of build and their relation to safe normal range of height and weight, would add materially to the ability of the physician to note errors of development and proportion at different ages.

In obstetrics and pediatrics, in psychiatry and orthopedics, as well as in the practice of medicine and surgery, frequent opportunities arise to illustrate not only the early or pre-clinical evidences of approaching but not yet subjectively recognized disease, but of the degree to which hygienic advice or appropriate surgical resources suffice in these early stages of disorder to return the patient to normal with minimum cost in time and money.

While diagnostic procedure in each of the main or special branches of practice are taught with a view to accurate detection of established disease, a period should be devoted in each department to explaining resources available for detecting the earliest possible variations from nor-

mal as well as the wide range of normality.

To emphasize the importance of the health examination, the professor of medicine should in the fourth year carry out under standard conditions of office practice before the class the routine procedure upon several presumably healthy clinic patients and give the patients appropriate directions with as much accuracy and completeness as is the custom in outlining the treatment of disease.

It is not new material or content in the present medical curriculum so much as a change in the point of view of the teachers that is required. Preventive medicine as a career belongs to the general practitioner. He has been taught to detect and treat disease. He is now called upon, to a rapidly increasing degree, to guide families around rather than through sicknesses. The periodic health examination, wisely promoted by all concerned with organized efforts for health as essential to our further progress in preventive medicine, calls for action by our medical faculties so that the hospital graduate may find himself at least as familiar with the healthy human as with the end results or long neglected or at least advanced and often preventable disease.

The portions of the above plan which deal with annual student health examinations, the teaching of preventable disease, obstetrics and pediatrics, are already in operation at the College of Physicians and Surgeons, Columbia University.

HAVEN EMERSON.

Minimum Entrance Requirements

Requests have been received to publish in the BULLETIN the requirements for admission to medical schools in membership in the Association as adopted at the Boston meeting in March, 1925, for the purpose of directing attention to the fact that provision has been made to admit certain applicants by examination. This is the most significant step toward

greater elasticity and removal of much of the rigid fixity of standards that has yet been taken. Many colleges do not seem to be aware of the adoption of this provision as set forth in Subsection II of Section 4 of the By-Laws. This section reads as follows:

Sec. 4. Requirements for Admission— Admission to medical schools and medical colleges in membership in the Association may be by:

(1) Satisfactory completion of a minimum of collegiate instruction, as provided below in Subsection I; or by

(2) Examination, as provided in Subsection II.

Subsection I. The minimum of collegiate instruction required for entrance to medical schools and medical colleges in membership in the Association shall be 60 semester hours (1) of work, which shall include the subjects hereinafter specified, in institutions approved by accrediting agencies acceptable to the Executive Council of the Association. Exception may be made under this section in that any member may admit applicants who have fulfilled the requirement in American or foreign institutions not approved by such accrediting agencies, provided that all admissions so made shall be reported to the Executive Council and shall be published in the next annual report of said Council.

All collegiate instruction given in satisfaction of this requirement must be based upon the same entrance requirements and must be of the same quality and standard of instruction as that required for a baccalaureate degree in the institution in which the candidate receives his preparation.

The 60 semester hours of collegiate instruction, indicated above shall include a minimum total number of semester hours in each of certain required

(1) A semester hour is the credit value of sixteen weeks' work, consisting of one lecture or recitation period per week; each period to be of not less than fifty minutes duration net. At least two hours of laboratory work per week shall be necessary to be considered as the equivalent of one lecture or recitation period.

subjects and the specified science subjects shall include a minimum number of semester hours of laboratory work as follows:

Requested Subjects	Minimum total semester hours	Minimum semester hours of laboratory work
1. General Chemistry (a) -----	8	4*
Organic Chemistry (b) -----	4	0
2. Physics (c) -----	8	2*
3. Biology (d) -----	8	4*
4. English Literature and Composition (e) -----	6	

Explanations as to content in each of these required college subjects together with suggestions to desirable additional study in certain subjects are as follows:

(a) **General Chemistry.** Eight semester hours required, including 4 semester hours of laboratory work. In the interpretation of this rule, work in qualitative analysis may be included as part of general chemistry. (2)

(b) **Organic Chemistry.** A completed course of 4 semester hours required, consisting of didactic exercises, which should cover a discussion of the aliphatic, carbocyclic, and heterocyclic series. (3)

(c) **Physics.** Eight semester hours required, of which 2 semester hours shall consist of laboratory work. It is urged that this course be preceded by a course of plane trigonometry. (4)

*Included in minimum total semester hours.

(2) It is highly desirable that either the elements of physical chemistry be included in the course in general chemistry, or presented as a supplementary course in the elementary physical chemistry.

(3) It is recommended that additional work be offered in organic chemistry and that this additional work include a fair proportion of laboratory work.

(4) In addition to the required course in general physics it is recommended that colleges provide an elective course suitable for students who desire more knowledge of physics than the general course affords and who expect to apply this knowledge in medicine and biology, rather than to engineering and physics.

(d) **Biology.** Eight semester hours required, of which at least 4 semester hours shall consist of laboratory work. This requirement may be satisfied by a course of 8 semester hours in either general biology or zoology, or by courses of 4 semester hours each in zoology and botany, but not by botany alone. Courses in physiology and hygiene, sanitation, entomology, bacteriology, histology and similar subjects covered in the medical curriculum shall not be accepted as part of the premedical college requirement in biology. (5)

Students who present at least 90 semester hours of college work may substitute for the above biologic requirements at least 8 semester hours in the psychologic or sociologic sciences.

(e) **English Composition and Literature.** The usual introductory college course of 6 semester hours or its equivalent is required.

Subsection II. Admission to medical schools and medical colleges in the Association may be granted to candidates on the basis of examinations as hereinafter provided. These examinations shall be conducted by such agencies as may be designated from time to time by the Executive Council of this Association.

(a) Candidates who have completed not less than 60 semester hours of collegiate instruction, but who have failed to complete the full requirements in not more than two of the required subjects may be admitted upon successfully passing examination in these subjects as above provided.

A candidate to be examined under this section must give evidence of scholarship of high order.

(b) Candidates who have completed not less than 90 semester hours of collegiate instruction, but who lack credit in any or all of the required subjects, may be admitted upon successfully passing

(5) In all cases the premedical biological work should emphasize the great generalization of biology—e. g., the cell doctrine, comparative anatomy and embryology, recapitulation of phylogeny in ontogeny, adaptation to environment, etc. Special attention is called to the value of an elective second year course in general physiology in which a study is made of the application of physics and chemistry to life processes.

ing examinations in these subjects as above provided.

All candidates for the comprehensive examination must present evidence of having accomplished work of distinction in one or more fields of learning.

The standards of instruction shall be as specified under subsection I.

Curriculum

Much has been said about the prescription of hours in the medical curriculum. In 1919 the Association adopted the report of a committee on revision of the curriculum in which percentages took the place of hours. The only reference to hours was the sum total of hours for a minimum four years course. The prescription for subjects was made in minimum and maximum percentages of the total hours, thus allowing considerable latitude for each individual college to arrange a curriculum which would meet its own special needs and conditions prevailing in its locality.

In 1923 another revision of the curriculum was made which permits of further possibilities of adjustment and individual arrangement. The percentage prescription was retained but all of the so-called water-tight compartments were eliminated as far as subjects in the course are concerned. Colleges may teach any subject at any time and virtually in any way without regard to its place in the curriculum or whether it is taught in classroom, laboratory or clinic. Furthermore, the new curriculum makes provision for elective work up to 24 per cent of the total number of hours in the whole four years course. Greater elasticity could not be given, short of abandoning entirely any time prescription as to courses, which no one has thus far advocated or even hinted at.

The present curriculum is as follows:

Sec. 5. **Curriculum.** The entire course of four years shall consist of from 3,600 to 4,400 hours, distributed as from 900 to 1,100 hours per year, and shall be grouped as set forth in the following schedule, each group to be allotted ap-

proximately the percentage of hours of the whole number of hours in the courses as stated.

1. Anatomy, including Embryology and Histology	14	—18½ %
2. Physiology	4½	— 6 %
3. Biochemistry	3½	— 4½ %
4. Pathology, Bacteriology and Immunology	10	—13 %
5. Pharmacology	4	— 5 %
6. Hygiene and Sanitation	3	— 4 %
7. General Medicine	20	—26½ %
Neurology and Psychiatry		
Pediatrics		
Dermatology and Syphilis		
8. General Surgery	13½	—17½ %
Orthopedic Surgery		
Urology		
Ophthalmology		
Otolaryngology		
Roentgenology		
9. Obstetrics and Gynecology	4	— 5 %
Total	76	—100 %
Electives	24	— 0 %

When the teaching conditions demand it, a subject may be transferred from one division to another.

Wider recognition of the real purpose of this curriculum will no doubt overcome many, if not all, of the objections that have been raised to curriculums in general.

Combined Collegiate and Medical Curriculum

That the Association has been cognizant of the value of so-called combined courses as in force in Canadian medical schools and offered by some schools in the States is shown by the prescriptions made in Section 6 of the By-Laws.

Sec. 6. Any medical school or medical college in membership in the Association may, with the consent of the Executive Council, substitute for the requirement laid down in Section 4 a six year combined collegiate and medical curriculum. The substitute plan shall provide the inclusion of the equivalent of at least sixty semester hours of subjects ordinarily given in the academic departments of standard American colleges of arts and science, including the required subjects specified in Section 4. In addition, the plan shall include re-

quirements equivalent to the curriculum set forth in Section 5. The medical school must submit to the Council of the Association the proposed six year curriculum giving the sequence of studies and the content and credit value of each course offered. Subsequent proposed changes in this six year course must likewise be submitted to the Executive Council for approval before they go into effect.

The provision "with the consent of the Executive Council" ensures adequate courses and combinations and gives such ventures in education the stamp of approval by the Association as a whole, for every action and ruling of the Executive Council must be submitted to and approved of by a majority of the schools represented at an annual meeting of the Association.

Advisory Function of Association

To increase its function as an aid to all institutions engaged in the preparation of students desiring to take up medical study later, the Association adopted Section 7.

Sec. 7. The Association through its Council and Committees is prepared on request to act in an advisory capacity to institutions engaged in preparing students for entrance to medical schools and medical colleges.

The force of this by-law can be made greater if its existence is brought to the attention of colleges of arts and science, preparatory schools, educators generally, and educational organizations in particular. This Association is well prepared to transmit much valuable information of this sort and to help in the better preparation of students for medicine.

Experiments in Medical Education

The statement has often been made that it would be well, even desirable, that certain medical schools, that are well prepared to do so, be permitted and encouraged to depart from all prescriptions and standards for the purpose of undertaking educational experiments, with the objective of improving conditions now existent.

At the Charleston meeting (1925) of the Association, Dr. Ray Lyman Wilbur introduced the following resolution which was adopted unanimously:

The Commission on Medical Education has been organized under the auspices of this Association, and with the help of individuals in the Association, the Rockefeller Foundation, the Carnegie Corporation, the American Medical Association and others. It became quite clear after discussion that it was desirable to have certain medical schools undertake experiments in the field of medical education. I was requested, as a member of a special committee, to ask the Association in an executive way to give opportunity to certain medical schools to modify the curriculum in any way they thought desirable and still not lose cast with the Association. We are also asking the same privilege from the state licensing boards. In order to get loose from the bonds which now bind institutions and hamper them, we are asking for certain rights to be given certain institutions.

An Experiment in Medical Teaching

During the last two years the Medical Department of the University of California Medical School has had the cooperation of some of the prominent alumni in the preparation of students for practice. These alumni have, severally, spent a week at the school carrying on, by seminar, lecture and personal contact, instruction in the art and practice of medicine. The experiment has proved of great value to students, interns and faculty, alike, and the alumni have expressed themselves as well repaid for the time spent at the school.

The purpose in giving the course,

was: (a) To give the student first hand information about general practice in communities of varying sizes to encourage graduates to enter this field; (3) To teach the student the tools of his trade which he may not get in the regularly scheduled courses; (c) To inform the student on applied therapeutics and the art of medicine; (d) To recognize the ability of alumni in general practice and to bring them back to the school for the mutual benefit of faculty, students and themselves; (e) To build up a strong and loyal alumni. In carrying out our plan four men were selected and each one was asked to spend a week at the school. During that time he was invited to visit the various departments; to learn something about present methods of instruction; to suggest what he would in regard to the possibility of carrying out certain measures in general practice; to witness operative procedures and to make rounds with the staff on the wards and in the outpatient department. Two seminars with senior students were held during each week and more or less formal talk given to the entire student body and house staff. Informal discussions with students were made possible.

This year a further experiment was tried during the second half of the fourth year, which is elective. Three selected students were sent out to communities of varying size and assigned for a month each to alumni in general practice. Another student spent a month in a group clinic where there is close cooperation on all cases.

The students and alumni have expressed themselves favorably on this method of instruction.

NOTICE

Copy for October issue of **Bulletin** should be in the editor's hands not later than August 15.

College News

Stanford University Medical School

The registration of the medical students in the different classes during the Winter Quarter is as follows: first year, 46; second year, 47; third year, 35; fourth year, 28; student internes, 27; total, 183.

The Medical School has received from Dr. Adolph Barkan, professor emeritus of structure and diseases of eye, ear and larynx, an additional donation of \$1,000 for the historical collection of the Lane Medical Library.

The forty-fourth series of Popular Medical Lectures under the auspices of the Medical School had the following program: Jan. 5, "Dietary Peculiarities of Children," Dr. H. K. Faber; Jan. 22, "Skin Disturbances from Foods and Drugs," Dr. H. E. Alderson; Feb. 5, "Ductless Glands and Obesity," Dr. Hans Lissner; Feb. 19, "Gastro-intestinal Disturbances and Nutrition," Dr. P. K. Brown; March 5, "Fatigue and Rest," Prof. E. G. Martin; March 19, "On the Prevention of Disease," Dr. G. E. Ebright.

The university received \$1,000 from Dr. Morris Herzstein for the establishment of a lectureship on the diseases of the Pacific Basin.

The Medical School also received \$2,000 from Mr. Roy N. Bishop in support of the research work done by Dr. Addis.

Dr. George B. Somers, clinical professor of gynecology and physician superintendent of Lane and Stanford Hospitals died of lethargic encephalitis Feb. 20, 1926, at his home at Woodside. Dr. Somers had received the A.B. degree from Harvard in 1880 and the degree of M.D. from the Cooper Medical College in 1888. In 1901 he became professor of gynecology

at the Cooper Medical College, a position which he retained until 1911 when the Cooper Medical College was taken over by the Stanford University. He retained connection with the new faculty as clinical professor of gynecology and was appointed physician superintendent of the Lane Hospital which is owned and controlled by Stanford University. Dr. Somers did a great work in building up the service at the hospital and in the outpatient department. During his incumbency, the new Stanford University Hospital was built and equipped under his direction. He developed the Stanford School of Nursing from small beginnings to its present state of efficiency. He saw his work crowned by the erection by the university of a new building which houses the nurses admirably and provides proper facilities for their instruction.

The Faculty of the Medical School has decided to reorganize the teaching in the clinical years in such a way that the third year medical students will work in the hospital wards where they will obtain thorough practical training in the investigation of patients. During the fourth year they will serve in the outpatient department where they will be given as much responsibility as possible and will learn to deal with the individual patients. During the fifth or compulsory interne year they will return to the hospital.

Dr. Frederick Leet Reichert of Johns Hopkins has been appointed associate professor of surgery in the Stanford Medical School beginning with the year 1925-27.

Dr. Emile Holman, who was appointed associate professor of Surgery last year, entered on his duties Dec. 1, 1925.

The Lane Medical Lectures this year were delivered by Professor Vittorio Putti of the University of Bologna. The next Lane lecturer will be Dr. R. Magnus, professor of pharmacology of the University of Utrecht, Holland. He will probably

deliver his lectures in December, 1927.

The teaching in Public Health and Preventive Medicine has been completely reorganized and Professor E. C. Dickson of the Department of Medicine has been placed in charge as acting executive.

The university has received the following gifts that are of interest to the Medical School: (a) Donation of \$4,000 from Mr. Roy N. Bishop of San Francisco in support of research work on diseases of the kidneys that is being carried on by Dr. T. Addis. (b) Donation of \$5,000 from Mrs. Dorothy Fries Lilienthal, to establish a scholarship in memory of her mother, Florence Hecht Fries, to be known as the "Florence Hecht Fries Scholarship in Medicine."

The Medical Faculty has decided to increase the number of students to be admitted to the Medical School to fifty in each class.

Northwestern University Medical School

In the new Montgomery Ward Memorial Building it is proposed that the freshman and sophomore classes shall be limited to approximately 100 students, the junior and senior classes to about 120 students.

More than 400 applications were received for matriculation in the freshman class of 1925 and 160 applications for junior registration.

Medical Students Who Do Not Graduate

The Medical Students' Register of the Council on Education and Hospitals of the American Medical Association has now been established for fourteen years and is bringing out some interesting data. During the fourteen years from 1911 to 1925, inclusive, 64,291 students were enrolled and, of these, 47,241, or 73.5 per cent, graduated. It is interesting to note also that of the 17,959 who have not graduated, 8,973, or 52.6 per cent, dropped out at the end of the first

year, and 3,884, or 32.8 per cent, dropped out at the end of the second year. More than 75 per cent of those who discontinued medical study, therefore, did so during their first two years, while less than 25 per cent were dropped during the advanced years.

College of Medical Evangelists

The cooperative plan of education in medicine was inaugurated in the fall of 1924. The present freshmen and the second year class are working under the new curriculum planned on the alternating arrangement, each student going to school and doing practical medical work in hospital, laboratory or medical office in alternating monthly periods. Approximately 175 students are thus occupied. They are distributed for their working periods in twenty-six different medical institutions. A majority of the freshmen class (72) are doing floor orderly work. Others are serving as surgical orderlies, nurses, roentgen-ray technicians, pharmacists' assistants, operators in physiotherapy, technicians in clinical, bacteriological and pathological laboratories and as physicians' office assistants.

The first class of students so engaged in their first year (six working months) earned an average of \$491.96 each. This amount includes an allowance of \$40 per month for those students serving in hospitals where full maintenance is provided. This group of students reported a total of twenty-six months of lost time for one reason or another, or an average of about nine days for each student during the year. The students' financial gain, however, is in the minds of the faculty not the prime object of the system. The real reason is the more practical training (as compared with the standard course) secured to the student by correlating his technical school work with his actual medical experience and contacts.

University of Louisville School of Medicine

The 1926 class of the University of Louisville School of Medicine has set a record in Louisville schools in number of hospital appointments taken. On March 1st, 8 per cent had accepted internships in twenty-nine approved hospitals. Pending appointments are expected to bring the percentage up to 88. Of the class of 1925, 79 per cent took approved hospital appointments, a gradual increase from 58 per cent in 1922.

A week of alumni clinics, featured by an annual alumni banquet, has been a part of the commencement program at Louisville for several years. Next June this program will be broadened by the active cooperation of the eight public hospitals in the city outside of the Louisville City Hospital, which is affiliated with the School of Medicine as its teaching hospital. Each of the other hospitals will also provide its own program of clinics, ward walks, laboratory demonstrations, illustrated lectures, etc., and a general invitation has been issued to all graduates in the state of Kentucky and neighboring territories and all Louisville alumni in all parts of the country.

More than 400 graduates attended the alumni clinics last year and 334 attended the alumni banquet. If the latest plan is successful this year it will be repeated, and alumni clinic week developed into a week of post-graduate teaching in all Louisville hospitals. The clinics are given under the general auspices of the Alumni Bulletin Board.

Scholarships in Neuropsychiatry

The Commonwealth Fund of New York has appropriated \$36,000 to support five fellowships in neuropsychiatry at the Graduate School of Medicine of the University of Pennsylvania. The requirements for the fellowships are that applicants must be between twenty-five and thirty-five years of age, graduates of a Class

A medical school and have had one year's approved internship. The fellowships are to be administered by a joint committee consisting of Dean Meeker, Dr. T. H. Weisenburg and Dr. Earl D. Bond, of the University of Pennsylvania; Miss Mildred F. Schoville, of the Commonwealth Fund; Dr. Frankwood E. Williams, medical director of the National Committee for Mental Hygiene, and Dr. Ralph P. Truitt, director of the Division on Prevention of Delinquency of the Mental Hygiene Committee.

University of Vermont College of Medicine

Dr. J. H. Jenne, professor of medicine and clinical therapeutics, has been appointed acting dean, succeeding the late Dr. Henry Crain Tinkham who died in December, 1925. At the annual meeting of the Board of Trustees of the University of Vermont to be held in June it is planned to select a full-time dean.

Syracuse University College of Medicine

Dr. H. G. Weiskotten, dean, professor of pathology and director of the University Hospital, has been appointed health commissioner of the city of Syracuse. He will continue his administrative work at the college.

Wake Forest College

One of the members of the Duke family has increased the endowment of Wake Forest College by \$200,000. The total endowment of the college is \$2,500,000. None of this money has been given specifically to the medical school. Wake Forest College School of Medicine teaches only the first two years of the medical course. Dr. Thurman D. Kitchen is the dean.

Tulane University of Louisiana School of Medicine

Dr. Aldo Castellani, the well known authority on tropical diseases, is now director of the department of tropical

medicine. He will organize and develop the department for teaching as well as research. Qualified graduate students will be eligible to apply for the degree of master of science in tropical medicine.

New York Post-Graduate Medical School and Hospital

The number of necropsies performed during the past five years has increased from 9.4 per cent in 1924 to 25.6 per cent in 1925. The college has a rule that instead of requiring the consent of an attending physician for the performance of a necropsy, the physician must, if he objects to having an autopsy performed on his patient, file a written statement to that effect.

Emory University School of Medicine

Of the \$10,000,000 expansion fund now being raised by Emory University, Atlanta, \$4,500,000 will be for the expansion of the medical school. The latter sum will be used to endow the school of medicine (\$2,000,000), endow the Wesley Memorial Hospital (\$2,000,000), or a pathology laboratory and administration building (\$225,000), for a nurses' home (\$200,000), and to complete the chemistry building (\$75,000).

Medical College of Virginia

The college has begun its campaign to raise one million dollars for buildings and endowment. Mr. W. T. Sanger was formally inaugurated as president of the college April 29, 1925. The new buildings will provide a dormitory for women, a new teaching unit to house the departments of biochemistry, pathology and bacteriology, the outpatient department, a dispensing pharmacy, and several other activities. The endowment sought will cover chiefly the establishment of a group of wholetime clinicians.

College. Any member of the American medical profession who feels inclined to make a gift to the Endowment Fund may forward a check to George W. Claridge, treasurer, Meharry Medical College, Nashville, Tennessee. The president of the College is John J. Mullowney, M.D.

National Board of Medical Examiners

The Board's certificates qualifying physicians to practice medicine are now recognized in more than thirty states and also in Great Britain.

Baylor University College of Medicine

All new students admitted to the Baylor University College of Medicine for the session 1926-1927 and thereafter will be required to submit to a complete and thorough health examination at the time of admission and annually thereafter until graduation. This work will be under the direction of the Department of Bacteriology, Hygiene and Preventive Medicine. Accurate and comprehensive records will be kept on forms similar to those recommended by the American Medical Association for periodic health examinations. A report covering the findings and advice will be given to the student and when advisable to the parents or guardian of the student. The institution will not refuse admission to a student on the basis of some physical defect but such student will be advised as to his or her condition and the possible outcome if he or she enters on or continues in the study of medicine. If such student remains then he or she shall be extended the advantages of the best care and treatment possible for the institution to give.

All students admitted to the College of Medicine for the session 1926-1927 and thereafter will be required to be vaccinated against smallpox at the time of admission and will be urged to submit to vaccination against typhoid-paratyphoid fevers. This

Johns Hopkins University

Dr. Wilbert C. Davison was elected assistant dean of the Johns Hopkins University School of Medicine.

Meharry Medical College

In October, 1926, the college will celebrate its Fiftieth Anniversary, and at that time the alumni of Meharry Medical College and the Negro people as a whole are asked to contribute toward the Endowment Fund of the work will be under the direction of the Department of Bacteriology, Hygiene and Preventive Medicine.

A department for periodic health examination will be established in the outdoor dispensary for the examination of the well and possibly sick. Only such individuals as are entitled to free service will be admitted for the examinations.

The Department of Bacteriology, Hygiene and Preventive Medicine in cooperation with the Texas State Health Department will offer a short concentrated course in Public Health this summer, probably in June. No fees for instruction will be charged and no certificates granted.

The College of Medicine and Baylor Hospital will again offer a series of diagnostic clinics in general medicine, surgery and the specialties during the first two weeks in June. All reputable physicians are eligible to attend these clinics. No fees are charged and no certificates granted.

The summer session will begin June 1 and will continue for six weeks. Courses will be offered in histology, neuro-anatomy, embryology, general pathology I, bacteriology and physiology I, immunology, pharmacology, biochemistry and laboratory diagnosis. These courses are regular medical college courses for which subject credit is given.

University of Buffalo School of Medicine

The ninth series of the Harrington Lectures was held at the School of

Medicine University of Buffalo, 24 High Street, May 6 and 7. These lectures were delivered by Charles R. Stockard, Ph.D., M.D., Sc.D., professor of anatomy, Cornell University School, on the general subject of "Heredity." The first lecture was on "The Mechanism of Inheritance;" the second, on "Inheritance and Development."

Patrick T. McIlroy, M.D., associate in pathology, has been awarded a Fellowship in Pathology by Queens University, Kingston, Canada. Dr. McIlroy will spend six months under Professor Hubert N. Turnbull, director of the Pathological Institute at the London Hospital, and professor of pathology in the London Hospital Medical School, London, England, beginning May 1.

William F. Jacobs, M.D., assistant professor of pathology, School of Medicine, University of Buffalo, will spend six months in study at the Pathological Institute of Prague, Czecho-Slovakia.

University of Kansas School of Medicine

Dr. George E. Coghill, professor of anatomy, has accepted an appointment from the Wistar Institute, Philadelphia, to a newly created chair of comparative anatomy.

Medical Education in Kentucky

A new law passed recently in Kentucky by the state legislature requires that the state board of health admit to its examination graduates of reputable schools who were admitted to the study of medicine after high school graduation, and, further, authorizes the board to examine second or third year students and, if they find them qualified, to grant them limited certificates, good for five years, to practice in a section of country where there are no physicians, but such practice will be conducted under the supervision of the county health officer.

Abstracts From Current Literature

Premedical Requirements

At the Congress on Medical Education, Licensure and Hospitals held in Chicago in February, Dr. Samuel P. Capen, chancellor of the University of Buffalo and a member of the Committee on Education and Pedagogics of the Association, suggested abandoning the prescription of the premedical curriculum. It is neither general education nor professional education. He suggested, further, that any new or additional classifications of medical schools give principal weight to an estimate of the competence and righteously of the institution. He believes that the time has come when quantitative measures can be dispensed with almost entirely.

Rigid Standardization

At the same meeting, Mr. Walter A. Jessup, president of the State University of Iowa, said:

When we look at the medical curriculum we find an almost absolute standardization as to the exact number of hours to be given to each of the laboratory sciences and the various clinical branches. Even the entrance requirements are likewise described in arbitrary terms. But little progress has been made in providing for experimentation on the part of the schools, permitting them to capitalize the advantages they naturally have in equipment and personnel.

Comments on Present Day Medical Education

In his chairman's address delivered before the Section on Medical Education of the Southern Medical Association at its last meeting, E. R. Clark, Medical Department of the University of Georgia, admits that

as compared with the situation twenty-five years ago medical education today shows vast progress. But, he says, there still seems to be something lacking, and in his opinion it is that the average graduate is not adequately trained in the scientific method. He terms the medical course of today too often a crazy quilt affair. In the large majority of the medical departments of American universities medical students are not securing a complete training in the scientific method. Consequently they are not adequately prepared for the practice of medicine, nor are the more capable of them trained to contribute to the store of medical knowledge. This training can be secured only by the carrying out to conclusion of substantial original investigations, either before, during or after their medical course. Clark believes that it is entirely feasible to arrange a medical curriculum in such a way that students may have time for original investigation, and to have a staff sufficient to oversee the research work of from one-fourth to one-half the students. It is suggested that the better students only be encouraged to undertake serious research work, and that provision be made in the way of elective courses, thesis and minor research work for the remainder. It is urged that in this way would be produced a stronger, better and more productive medical profession.—(*Southern Med. Jour.* 19:144 (Feb.) 1926.

Appreciation of Anatomical Relationships

Dr. J. C. Boileau Grant, professor of anatomy in the University of Manitoba, Winnipeg, is an Edinburgh graduate who reversed the usual order of progression by going into anatomy from surgery. He believes in teaching anatomy purely for its value in the practice of medicine and surgery. He says:

It is frequently stated and no doubt frequently believed that "Anatomy is merely a question of memory." For

some reason the other subjects which enter into the medical curriculum are regarded as falling into a different category; a knowledge of them once acquired is retained presumably forever. Whatever be the reasons why this belief is so prevalent, I would suggest on the contrary that a knowledge and understanding of anatomical relationships and details depend upon an appreciation of certain principles and facts, and upon logical reasoning, as much as does a knowledge of other medical subjects. These remarks apply to all parts and to every structure in the human body. If the student would recall to mind an anatomical picture with any degree of accuracy, this is a habit of mind he should cultivate as he approaches the subject.—*Canadian Med. Assn. Jour.* 15:1195, 1925).

National Cooperation in Education

In an exceedingly comprehensive and understanding manner, C. R. Mann, director of the American Council on Education discusses (*Educational Record*, April, 1926) attempts, results and further needs for cooperation in Education between various groups of educators and educational organizations. Reprinting the paper in its entirety is desirable but space forbids. Only that portion bearing on medical education can be reproduced. Mr. Mann says:

Admirable as are the results of this specialized cooperation in advancing the competency and the interests of the group concerned, there is danger of overdoing it. If a specialized group becomes so absorbed in its own field that it fails to cooperate with other specialist groups in territory where their interests overlap, it may tend to become an organized minority or bloc that tries to get what it wants willy-nilly. Signs are not wanting that the liberal arts college is in dire perplexity because of conflicting requirements for pre-professional train-

ing by diverse specialized groups. Sound progress demands cooperation for the common good among groups of widely different interests. What is the cooperative procedure in such cases? Have the medical schools and the liberal arts colleges any common objective that is specific enough and dynamic enough to generate vital cooperation between them? What have law and medicine as a common need that is pressing enough to compel sustained cooperation in education between doctors and lawyers? How might schools and employers or their graduates help one another to turn out a better product? These questions are of profound significance at present, not only to the professions concerned, but more especially to liberal education.

Examination of the activities of a number of these groups of specialists shows that there is very little cross-cooperation among them. Professors of medicine do not know overmuch about what professors of law are thinking and doing. Similarly, in spite of the demand by practicing engineers for more liberal training for engineering, one seldom sees professors of engineering at the meetings of the Association of American Colleges. In most universities the faculties of law, of engineering, of medicine, and of arts, literature and science are distinct and autonomous bodies. The tendency among the specialist groups to play lone hands is evidenced by such hybrids as business English, calculus for engineers, physics for medics, or commercial arithmetic.

While few will try to justify this situation, nearly everyone seems to regard it as inevitable. The universal excuse is that the mass of subject matter that must be covered in each field is now so vast that it is impossible in the time available to do more than cover the subject matter essential to each specialty. Since knowledge in every field is now expanding at an unprecedented rate, the jam is getting tighter every year.

Medical men have no monopoly in this situation. Every specialized group is up against the same impasse. Hence the suggestion that perhaps the specialist groups, might help one another by some sort of cooperation.

It is respectfully suggested that the solution of this so-called manpower or personnel problem in education is a specific objective that is dynamic enough to command the enthusiastic service of every group of specialists. Hence it furnishes a vital basis of national cooperation. Imagine, if you can, a medical school in which every student has medical interest, medical ability and medical bent. With such a student body, would not at least half of the present pesky problems vanish? And are not law schools quite as much interested in preventing men of medical capacity from entering law schools as medical schools are in securing them? The appalling waste of the present haphazard methods of discovering individual capacity is forcefully revealed in a recent report of the current investigation of engineering education. This states that 60 per cent of the students in engineering colleges come from the top third of high-school classes and 37 per cent more from the middle third. But though 97 per cent of the students are thus of demonstrated intelligence, only 28 per cent of them graduate in the specified four years. The other 72 per cent are "weeded out" as incompetents or misfits.

Discovery of better methods of appraising human abilities and evolution of appropriate activities for their development are not only effective common objectives for cooperation among educational organizations; they are also the fundamental problems in all the world's work. The word "personnel," which was seldom heard before the war, is now in general use. At conventions of industrialists and business men one now hears much of "personnel problems." All are trying to find how "to fit the man to the job."

The greatest opportunity for stim-

ulating sound progress in education in America today lies in the creation of adequate machinery of national cooperation among existing agencies.

It is certain that such national machinery will soon be set up. To meet all needs it might well resemble the present analogous organization for Commerce, which consists of a publicly controlled Federal Department and a privately controlled National Chamber. These two work in close cooperation, each doing the things the other cannot do as well.

Education needs the same dual organization—an adequate Federal Education Office and a voluntary national federation of educational agencies operated and controlled by educational institutions. The Bureau of Education and the American Council on Education are suitable nuclei about which such a dual organization could be created, but at present neither has adequate financial support to begin to do the job.

Organization of the University Medical School

At the Congress on Medical Education, Medical Licensure and Hospitals held in Chicago, Feb. 15, 1926, Dr. Arthur Dean Bevan, chairman of the Council on Medical Education and Hospitals of the American Medical Association, made this the subject of his chairman's address. He stressed the fact that the task of developing a modern medical school has become one of the greatest, one of the most important functions of a university. It is also one of the most difficult and costly pieces of work that a university can undertake because the development of a medical school cannot be made along the same lines as other departments. A medical school must be developed along broader lines. The medical school, through its hospitals and dispensaries, its infant welfare work and its public health work, is not simply a department of the university interested in teaching and research; it is more—it is one of the most im-

portant of the agencies which can secure for the people the great benefits of modern curative and preventive medicine. In organizing the medical school, the community should be taken into the scheme as an active partner. The community must be made to realize that this is both a university and a community affair. The cost of the medical school must be divided between the university and the community. The cost of the medical school buildings, the facilities for research and the salaries of the teachers must be borne by the university. The cost of building and maintaining hospitals, dispensaries and clinical laboratories must be borne by the community. Municipal, county and state officials, university presidents and trustees and trustees of hospitals must be convinced that the public can secure for itself and children better medical service by cooperating with the hospitals and dispensaries and the medical departments of universities.

As to location of the medical school: it should be located in close contact with the university. It is not essential that it be located on the university campus, but it is desirable to have the school in close contact with the other scientific departments of the university, especially those of physics, chemistry and biology. It is also essential that the medical school be in contact with a general hospital, with dispensaries and with special hospitals, such as maternity, children's, orthopedic and contagious. (Dr. Bevan omitted hospitals for nervous and mental diseases. Ed.) The ideal situation is one permitting of development of the medical school in contact with the hospitals of the community and the scientific departments of the university. The site chosen should be large enough to accommodate the medical school, a large general hospital and dispensary and a number of special hospitals.

Faculty: The members of the faculty should be graduates in medicine who should keep in close touch with

medicine even though they are teaching in laboratory branches. A man without such training is regarded as being seriously handicapped and one who may be an actual menace. These so-called sciences in medicine must be studied and taught from the standpoint of their relation to medicine. The members of the faculty in the laboratory branches should be full time university instructors and should be well paid. The members of the faculty teaching clinical medicine should not be full time teachers, but they must be university teachers and trained research men as well as expert clinicians. They need not be as well paid as the laboratory teachers, but they must retain their normal relationship to the community and the medical profession. They must be both teachers and practitioners of medicine. The heads of the clinical departments, especially those of medicine and surgery, should be very broadly trained men.

Requirements for Admission: The present requirements of two years of college work, partly specified, four years in medicine and an intern year is regarded as being wholly satisfactory and sufficient. But Bevan advocates shortening the time of study by the general adoption of the six year combined course and by cutting out two years in the primary and secondary school work so that medical students can be graduated at 25 years of age and not at 28, as is the case now.

Number of Students: Bevan would not have less than fifty students in a class, nor more than 150. The larger medical school has many advantages. Large classes furnish inspiration and enthusiasm for both instructors and students.

Curriculum: The purpose of the curriculum is to train men to practice medicine and it must be constructed, and the work carried on, with that end in view. What the student needs is a working knowledge of those parts of anatomy, physiology and pathology that are essential in the practice of medicine. A complete

training in these sciences must be individual and special and must be secured in graduate study. It must be made plain to the medical student at the very beginning of his course that he is studying medicine and for this purpose he should very early be brought in contact with patients, with the clinic, by attending two hours of clinical work in general medicine and two hours of general surgery each week. These clinics should be given not by a junior assistant but by either the head of the clinical department or some broadly trained associate. In each clinical department it will be necessary to teach the anatomy, physiology, pathology and pharmacology involved in each clinical case as well as diagnosis and therapy. The dispensary should be used as a most important factor in clinical teaching. In their senior year the students should be a large part of their time in the hospital in direct contact with patients, acting as interns or clinical clerks.

Interne Year: It is urged to make this year a requirement for licensure by all state boards and all medical schools. It has been shown to be practical and of great value. It can best be administered by a special committee of the faculty, known as the fifth year committee. No one should be permitted to practice medicine who has not had the practical experience of serving at least a year as a hospital interne. Whether this shall be a rotating or a single service is still under discussion. Students seem to prefer the former. However, both types should be accepted, provided they are of the required standard and given in acceptable hospitals.

Cost of Building and Maintenance: The cost of a medical school plant is variously estimated at from \$1,500,000 to \$3,000,000. These sums include six laboratory buildings and a building for the clinical branches, clinical laboratories, research laboratories, administration, medical library, etc. The annual cost of conducting

a medical school is placed at from \$315,000 to \$500,000. From these amounts may be deducted student fees, 500 students at \$300 each per year, or \$150,000. The capitalization of the endowment is placed at from \$4,800,000 to \$10,000,000. These figures include the cost of buildings (\$1,500,000 to \$3,000,000, respectively). The extra cost of a charity hospital is estimated as: a 500 bed hospital and dispensary, \$3,000,000; cost of maintenance as a charity hospital, \$500,000 per year, at 5 per cent, an endowment of \$10,000,000; a total of \$13,000,000. Placing the clinical faculty on a full time basis would probably add \$150,000 per year to cost of maintenance; that is, 5 per cent on an endowment of \$3,000,000, bringing the total investment to \$16,000,000, which Bevan regards as a prohibitive sum, one which would never be considered seriously by a board of university trustees composed of men of good judgment and good business sense.—*J. A. M. A.* 86: 591 (Feb.) 27), 1926.

University's Function in Medicine

Mr. H. M. Tory, president of the University of Alberta, Edmonton, insists that the fundamental sciences must be taught as university subjects with sufficient intensity to make the student realize that they are not incidental to but fundamental to a proper medical course. The instruction should be in the hands of full-time men.

There is a sense in which medicine may be regarded as a practical synthesis of the sciences in regard to the life she draws from every science. The standard of examinations must be university standards, not special ones designed to help out the members of a special faculty. The university should also function in determining the type of men who are allowed to enter the profession of medicine. The proper practice of medicine and surgery demands quali-

ties, mental, moral and emotional, of the very highest order.

The university must function in medicine as the home of research. A university faculty cannot remain a vital teaching body otherwise. To do this it is absolutely necessary to have a full-time staff for all departments, including, if possible, the clinical departments. To be taught by a real discoverer creates a noble enthusiasm in the minds of ambitious students. If the university is to function completely, the university hospital becomes of necessity a part of the medical school. It is here where the full-time scientist and the clinician meet and where the laboratory worker finds the fruition of his efforts.

The university has another important function to perform which it can do successfully if given an opportunity. The first step must be the passing of the power of conducting examinations for the practice of medicine over to boards appointed by the university, thus freeing the medical profession from the charge of personal motive; then the universities will be in a position to say to the legislatures that there must be common standards in scientific subjects. The universities are prepared to set these standards. One other thing the universities must do: they must establish special standards of examination for those who are permitted to appear before the public as specialists.

Medical Program and Its Reactions

Mr. A. B. Dinwiddie, president of Tulane University of Louisiana, feels that the greatest possible emphasis has been laid on the work of the four years of the medical school, with little or no attention to the substructure, the academic basis. We cannot have satisfactorily trained physicians unless we consider the medical program as a whole and give adequate support to every part of it from beginning to end. A student beginning his six year

program at an independent college of liberal arts may be unable to get into any medical school as a result purely of a lack of accommodation, and a student in a two year medical school may find himself unable to complete his medical course because there is no room for him to enter a four year medical school by transfer.

Medical School Problems

Dr. Irving S. Cutler, dean Northwestern University Medical School, discussed some medical school problems in the *Northwestern Alumni News* (5:13 (March) 1926) He said in part.

Within the past four or five years there has arisen in the minds of the medical profession at large an idea which has also found echo in the minds of the people, that medical schools must provide adequate preparation for the practice of medicine. Charlatanism, quackery and cultism flourish best in communities supplied with poorly trained physicians. People want relief from illness. On the failures of medical men are built, on the part of the average individual, suspicion, distrust and lack of confidence. Medicine is not miracle working and the average of our citizenship do not expect miracles. The people have a right, however to demand a logical diagnosis, careful and conscientious attention to those who are ill and an interest in community health on the part of every well trained practitioner.

Under the system of training which has grown up during the past twenty years too many of our graduates have been taught to look upon patients as specimens rather than human beings. The laboratory courses have had, in a sense, a tendency to develop parrot-like, rather than broad thinking, and the larger conception of the duties of the physician have been lost. There will always be a reasonable percentage of students in medicine who because of special apti-

tude will engage in research and investigation, both clinical and laboratory. To these the school must at all times extend a helping hand. There must of necessity be sufficient equipment for this choice group and the stimulus and inspiration of instructors who are themselves investigators. The school that has for its sole object the training of physicians will fail, for there is constantly required contacts with research else medicine becomes lifeless; a closed book.

There has been proposed no reasonable way in which the four medical years may be reduced in time or in subject content, and there has come as a natural urge on the part of the student a tendency to devote more and more time to the interne or assistantship period. A one year internship entirely satisfactory twenty years ago is no longer looked upon as reasonable or proper. The average interne period should be from two to three years and this in many cases followed by an assistantship of from three to five years. No phase of medical education deserves more consideration at the present moment than the best plan under which the student, on the completion of his medical school curriculum, shall spend the two to five year period immediately following.

To handle too many students in a given class defeats the purpose of instruction; the development of the power of logical thinking on the part of the individual student. In spite of the fact that medical students are somewhat older than those in colleges of arts they require considerable personal attention and guidance and many of them have to be taught how to study. The old preceptor system had many advantages over the present highly organized system in that the student received constantly the personal guidance, criticism and encouragement of his preceptor.

Diploma Mills

The National Better Business Bureau of the Associated Advertising

Clubs of the World has organized the following committee to aid publishers who have expressed a desire for authoritative information about the advertising of diploma mills and those home study advertisers whose course are of negligible educational or training value: Dr. James A. Moyer, Division of University Extension, Department of Education, Commonwealth of Massachusetts and Secretary-Treasurer of the National University Extension Association; Dr. R. C. McCrea, Hepburn Professor of Economics, School of Business, Columbia University; A. Wellington Taylor, Dean of the Graduate School of Business Administration, New York University; N. C. Miller, Head of the Department of Engineering Extension of Pennsylvania State University, recently appointed Director of Industrial Extension at Rutgers.—*Educational Record* 7:23 (Jan.) 1926.

Preparation and Practice in Medical Education

This subject was the topic of an address delivered by Dr. Clarence Cook Little, president of the University of Michigan. He said in part:

Certain clearly defined academic functions rest squarely on the so-called premedical curriculum. It represents the college training which is intended to provide a foundation on which a student may build successfully a mental structure which will carry him through the technical work of the medical school and thence out to practice or to research. In such a foundation there must, very obviously, be certain subject matter courses which will provide him with tools later to be used in his professional training. Chemistry, physics and biology are subjects in which actual terms and processes are to be obtained for later use. But medicine, whether in general practice or in special fields, must also deal with people. This involves two clear responsibilities which the medical practitioner must assume.

First, he must try to train himself as a scientist to understand the subjects which lie at the root of a proper analysis of his patient, and second, he should fit himself as a personality to meet and to satisfy the unanalyzable part of his patient. The third type of courses which is to be added to those comprising the "tools" and to the "human structure and behavior" groups, may be, somewhat lamely, described as "cultural." Under the shadow of the widespreading branches of this designation are to be found those courses which will rapidly under the direct sun of a materialistic attitude and yet properly appreciated and evaluated add more than almost anything else to the enrichment of personality and to the establishment and maintenance of natural and lasting friendships with patients and their families. A small fourth group of "equipment" courses may also prove advisable. They are not needed in every case—as courses, but the subject matter contained in them must somewhere and somehow be acquired.

Dr. Little recognizes four groups of needed courses in premedical training. (1) Scientific and Subject Matter—(Chemistry, Physics, Biology). (2) Human Structure and Behavior—(Psychology, Ethnology, Sociology, Genetics, Morphology and Anatomy). (3) Cultural—(Comparative Literature, Fine Arts, Music, History, General Economics and Philosophy). (4) Equipment—(Modern Languages, Business Principles and Elementary Accounting). As to the time which such a program would take, it is Dr. Little's belief that it would, in the vast majority of cases, mean at least three years. In many cases it would seem that four years of college and an A.B. degree might be desirable. This would be especially true of the younger students who might well, if they entered college at 17, plan to put a full four years into their premedical work.

Many men combine the two abilities—that of the science of medicine and that of the practice of medicine—in varying degrees and proportion. In almost every case, however, an emphasis exists and can be found. It is the recognition of this leaning or "bent" of the student which, as Dr. Little sees it, should form one of the main duties of the medical curriculum. Some assistance in this direction will, without doubt, be given by a better planned "premedical" period of training. There will probably remain, however, plenty for the medical course itself to accomplish. If we consider what groups are included in the product of our medical schools we find that their number will cover (a) general practitioners, men usually serving the medical and surgical needs of small or medium sized communities, (b) surgeons, in various degrees of specialization, (c) physicians in similar grades of specialization, and, (d) men who undertake laboratory research and investigation. Teachers may come from any of the groups although their origin within the ranks of general practitioners is today comparatively rare. Administrators may come from any of the four groups—they, like teachers of medical subjects, develop gradually rather than prepare themselves deliberately. In addition to recognizing the need of developing methods for training the four types of product referred to, there are two general matters which should, it seems, be included in the group of studies given during the medical course. The first of these involves a recognition of the responsibility of medical men towards programs of public health and sanitation. This attitude should be inserted in the curriculum in such a way as to bring it to the attention of the medical school as a normal point of view which he, as a citizen, will be called upon to consider. The interrelation of his activities as a medical man with those of citizens working on pub-

lic health problems should be made clear throughout his medical training. The second matter involves at least one reading and discussion course in general problems of human behavior which will prevent the complete rupture of the connection with the broad nontechnical phase of premedical training. We are apt to lose sight of the fact that a doctor has also a right to be a man and that he may fairly expect mental recreation as well as golf or tennis. Any methods which can be devised to guarantee to him in his "incubation" and "brooder" period more care and a curriculum planned for him as well as for his profession would at present be helpful.—*Annals of Clinical Medicine* 4: 781 (April) 1926.

Tuition at the University of Pennsylvania

The average undergraduate tuition charges at the University of Pennsylvania have been \$275 annually for full-time students. The cost of the education furnished has been more than twice this sum. The Provost of the university, Mr. J. H. Penniman, has conducted an investigation of the situation in respect to tuition at various other institutions. He has found that the general tendency and intention is to raise tuition fees in general and at the same time to make adequate provision for those who are entitled

to university education but demonstrably have not the means to pay for it. Quite a number of institutions have this year increased their fees or will do so next year. The cost of education, which covers the primary objective that the student has in mind during his undergraduate life, is wholly out of proportion to the other expenses incident to his educational life, such as housing, clothing, food, amusements, etc. It is also out of proportion to the increased costs of building materials, supplies, wages, etc., which the university must pay.

As a result of this investigation Mr. Penniman has recommended to his Trustees that tuition rates be increased. This recommendation has been approved and the following rates will be in force beginning September 1, 1926: In all of the undergraduate schools and in the graduate and professional schools, other than the Graduate School, School of Veterinary Medicine, Graduate School of Medicine and the School of Dentistry, the fee for next year's entering students will be \$400 per year. For students who are present matriculates of the university, the fee in these schools is advanced \$50 per annum, beginning with 1926-1927.

No change has been made in the Graduate School of Medicine fee. A flat fee of \$250 will be charged for full time students in the Graduate School.—*Educational Record* 7:95 (April) 1926.

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